A Factorial Representation of Suicidal Ideation Among Academically Gifted Adolescents

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Suicidal ideation assessment has been employed as an early screening method for identifying adolescents who are at risk for engaging in suicidal behaviors. While recent evidence has emerged that gifted adolescents do not have a higher rate of suicidal ideation, research on the psychological and personality characteristics of gifted youth have demonstrated that they differ from nongifted students in their mental representations of self. Therefore, this study examined the factorial representation for suicidal ideation among an academically gifted population. The results reveal the structure of suicidal ideation for the gifted sample in this study differs from the established normal sample. Further, the factorial representation outlined for suicidal ideation in the gifted sample supported the suicide trajectory model (Stillion & McDowell, 1996), providing a theoretical base for future intervention and refined assessment.

Background

Research on suicide has repeatedly referred to the epidemic proportions that have been reached in the number of suicide attempts and completions, particularly when viewed across a historical frame of reference (e.g., Ritter, 1990). Suicide rates have grown over 240% among adolescents and young adults over the last 5 decades (American Association of Suicidology [AAS], 2004). While there has been a slow but steady decline in rates of suicide since 1994 (dropping steadily from 13.8 to 9.9 suicides per 100,000 individuals ages 15–24), suicide still is the third leading cause of death among

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adolescents (AAS), with 4,010 confirmed suicides reported for the 15–24 age group in the official 2002 final data report (Kochanek, Murphy, Anderson, & Scott, 2004). While these numbers are sufficient cause for concern, estimates indicate that for every successful attempt, there are as many as 25 unsuccessful attempts (AAS). A primary precursor to these attempts is fixation on death or suicide, or entertaining thoughts about committing suicide, with one report indicating 85% of suicide attempters had revealed suicidal ideation in advance (Pinto, Whisman, & McCoy, 1997).

One strategy that has been employed in the effort to reduce the rates of suicide attempts and completions for all age groups has been the use of screening measures to provide early identification of individuals most at risk for suicidal tendencies (Lacy, 1990). To that end, Reynolds (1987) created the Suicide Ideation Questionnaire, which has been shown to provide effective differentiation between suicidal ideators and nonideators (Muehlenkamp & Gutierrez, 2004; Pinto et al., 1997; Ritter, 1990).

Historically, there have been repeated suggestions that gifted individuals are more likely to think about and/or commit suicide, perhaps due to the examples of suicidal adults in the public eye who were "gifted artists" or "talented writers." However, Cross (1996b) demonstrated there are no reliable data on the prevalence rates for suicide among the gifted, largely due to the absence of sound empirical data on gifted individuals (see also Neihart, 1998). Based on the established data, we are confident that gifted adolescents—like all adolescents—are committing suicide at greater rates than they were five decades ago (Cross). In a recent report, we have also identified that the rate of suicidal ideation among gifted students does not differ from the general population of adolescents (Cross, Cassady, & Miller, in press), consistent with Baker's (1995) analysis of suicidal ideation and depression among gifted and nonidentified adolescents.

While recent studies do not support the myth that gifted adolescents are more suicidal than their nongifted peers (Cross, 1996b), it is possible that the two groups differ in the manners with which they cognitively represent suicidal ideation or have differential manifestations of suicidal thoughts. It has been established that the social and

emotional needs and experiences of gifted individuals often differ from the nongifted population. The adolescent years in particular are reported to be potentially quite difficult for gifted individuals; as the range of "acceptable" behaviors within a peer group become constrained and the differences of the gifted adolescents become highlighted, gifted adolescents face the conflict between maximizing their abilities and fitting in with the peer group (Cross, Gust-Brey, & Ball, 2002). When examining psychological type profiles of gifted adolescents as compared to the normal sample, the gifted students were to differ on all four dichotomies, with a strong preference for intuitive-perception profiles (Cross et al., in press; Cross, Speirs Neumeister, & Cassady, in press). These variations in the psychological profiles of gifted adolescents do not appear to modify the overall rate of suicidal intent, thoughts, or attempts; however, sensitivity to differential conceptions of self are necessary to ensure that the reliable indicators of suicide risk are appropriately applied to the gifted population.

Suicidologists have attempted to classify the characteristics that place individuals at greater risk of suicide. Stillion and McDowell's (1996) conceptualization summarizes the various orientations that have been offered from various dimensions of psychological thought. Their suicide trajectory model summarized four primary categories of risk factors: (a) biological (e.g., depression, gender, genetics); (b) psychological (e.g., self-esteem, depression, feelings of hopelessness); (c) cognitive (e.g., poor problem solving, inflexible thinking, low coping strategies); and (d) environmental (e.g., family experiences, life events, presence of deadly weapons). The interactions among these factors are also essential considerations in determining the likelihood of suicidal risk (Stillion & McDowell). For instance, as Holmes (1991) offered, in the face of extreme perceived stress (environmental/ psychological), adolescents will often view suicide as an escape. Under these conditions of stress, poor problem-solving strategies (cognitive) are typically displayed, leading to inflexible thinking and fixation on a limited selection of potential solutions to the problem. Thus, once suicide is generated as a possible solution to the perceived problem, the individual is likely to perseverate

on suicidal thoughts and tendencies until an attempt is made (Holmes). The probability of a successful attempt is heightened when firearms are readily available (environmental) and particularly for adolescents with depression (biological).

Cross and his colleagues have conducted psychological autopsies of four gifted youth who committed suicide (Cross, 1996a; Cross et al., 2002). In these reviews of tragic suicide completions, several similarities among the gifted adolescents were found that can be aligned with the suicide trajectory model, demonstrating the viability for exploring suicidal risk in gifted youth. First, all four were males and incidences of depression were noted in select cases (biological). Second, the young men had minimal social outlets, experienced intense emotions that they desired to be rid of, and reported conflict, pain, and confusion at times due to peer ridicule and rejection (psychological and environmental). Third, they all engaged in discussion of suicide as an honorable or viable solution and maintained hierarchical, polarized, egocentric value systems (cognitive; see Cross et al., 2002, for extended discussion).

Present Investigation

While recent research suggests that there are more similarities than differences when comparing gifted and nongifted adolescents on factors related to suicidal ideation, the cognitive and psychological dimensions contributing to suicidal tendencies require further examination. To accomplish this task, this study explored a factorial representation of suicidal ideation, using responses to the Suicidal Ideation Questionnaire (SIQ) offered by a sample of gifted adolescents compared to the normative sample for the SIQ.

The normative sample of the SIQ included more than 2,000 adolescents and the data support high reliability (coefficient α = .97), strong internal consistency (.90), and moderate to strong construct validity (ranging from .52 to .70) based on positive correlations with related constructs such as depression and hopelessness and negative correlations with self-esteem (Reynolds as cited in Range & Knott, 1997; Mazza & Reynolds, 2001). Reynolds

(1987) conducted a factor analysis that resulted in a three-factor solution that accounted for 67.7% of the variance. The first factor encompassed 25 items that were interpreted to represent wishes and plans to commit suicide. Factor 2 included 9 items (cross loadings were allowed despite the presentation of an orthogonal rotation) and was described as relating to the responses and aspects of others. Factor 3 (3 items that did not cross load on other factors) was described as morbid ideation, with heavy loadings from items dealing directly with death.

Method

Sample

Students enrolled in a 2-year residential public high school for academically gifted adolescents during the fall semesters of 2003 and 2004 contributed the information used in this study. There were 334 students in the available population (186 females, 148 males). The students were entering the 2-year program at the beginning of their junior year of high school. To be admitted to the school, students provided information on several criteria. Scholastic Aptitude Test (SAT) scores, other standardized test scores, grades, evidence of passing the state's high school proficiency exam, essays written by the student, and recommendations from three teachers, a guidance counselor, and parents were required.

Average scores on the SAT completed during their sophomore years confirmed that the students were advanced in basic academic proficiencies in math (M = 593.15, SD = 80.00, n = 317), verbal (M = 586.72, SD = 79.31, n = 317), and writing (M = 554.43, SD = 94.48, n = 316). In addition, information about class ranks (the ranks of students in their home high school prior to enrolling in the gifted program) was available from most of the students. For the 287 students whose high schools reported such figures, the data revealed the average student scored in the top 7.4% of their class by the end of their sophomore year.

Procedures

The participants completed the Suicidal Ideation Questionnaire (SIQ) as part of school entry procedure at the beginning of their junior year. The data were collected to identify any students requiring additional counseling assistance. The SIQ (titled "About My Life" on the response form students saw) is a 30-item self-report measure used to assess the prevalence and frequency of suicidal thoughts in adolescents (ages 13–19; Reynolds, 1987). The adolescents rated each response on a 7-point Likert-type scale that assessed the frequency with which that particular cognition had occurred within the previous month. The response format ranged from 0 (never had the thought) to 6 (almost every day). Items were scored from 0 to 6 with higher scores indicating the presence of more suicidal thoughts.

The students' responses were then analyzed with an exploratory factor analysis to determine the level of congruence to Reynolds' (1987) three-factor solution. Exploratory was determined to be the advisable strategy rather than attempting to confirm the results in Reynolds' professional manual for two primary reasons. First, although previous research has shown gifted students to demonstrate norm-consistent levels of overall suicidal ideation, there is no prior research examining the factorial nature of suicidal ideation with this population. Second, Reynolds' factor analysis employed the Varimax rotation, assuming the factors were orthogonal. After deliberating this decision, our choice was to employ an oblique rotation as we anticipated statistically significant correlations among the identified factors.

Results

Using an exploratory factor analysis with the maximum likelihood extraction method, we determined that the most reasonable factor structure for the gifted sample included four factors. There were six factors that produced an initial eigenvalue greater than 1.0 (see Table 1). However, there was a reasonable split between the fourth and fifth factors, as demonstrated by both the eigenvalues and analysis of the screeplot. Furthermore, deliberate comparison between the

Component	Total	% Variance	4-Factor Rotated Loading
1	12.07	40.22	11.57
2	2.29	7.63	1.86
3	1.82	6.07	1.46
4	1.73	5.78	1.12
5	1.24	4.14	
6	1.09	3.65	

Table 1
Exploratory Factor Analysis Summary Table

six-factor rotated solution revealed that the fifth and sixth factors merely fragmented the proposed four-factor solution with no meaningful gains in model explanation and equivalent representation of the explained variance. Thus, we present the following four-factor model as the most reasonable factorial representation of the SIQ for gifted adolescents.

Based on our expectation that the factors derived from this scale would likely be correlated, we chose an oblique rotation strategy to allow for factor correlations to be maintained. The Promax rotation approach generates a rotated solution to the maximum likelihood factor analysis that is intended to explain the variance in responses for each individual scale item with the fewest number of factors. Following conventional guidelines for interpreting the factor structure, we only report factor loadings greater than .32 (Costello & Osborne, 2005; Tabachnick & Fidell, 2001). Interpretation of the oblique rotation is most conceptually relevant by examining the pattern matrix (see Table 2), which reports the contribution of each factor to explaining the variance in the scale items without reporting the shared variance between correlated factors. In essence, the pattern matrix reports factor loadings that represent partial correlations with the factors. The structure matrix (Table 3) reports all correlations among the factors and the items without removing the overlapping variance generated by correlated factors. Finally, the intercorrelations among the factors (Table 4) is reported to confirm the presence

Table 2
Four-Factor Pattern Matrix With Primary Factor Loadings

	Factor 1	Factor 2	Factor 3	Factor 4
Frequency of entertaining the thought	Suicidal	Morbid	Social	Social
of	Pragmatics	Fixation	Isolation	Impact
Wish had right to suicide	.98			
If had chance, would kill self	.86			
If things don't get better, I would	.85			
Wish had nerve to kill self	.79			
Wondered if had nerve to kill self	.69			
When would commit suicide	.56			
Tell others plan to kill self	.50			.45
Killing self would solve problems	.44			
Better if I was not alive	.39			
Life not worth living	.34			
Thought about suicide, but would not		.79		
Committing suicide		.76		
Having bad accident		.71		
People dying		.65		
What to write in suicide note		.63		
How people would feel if committed suicide		.57		
How would commit suicide	.39	.57		
Considered writing a will		.53		
Thought of death		.52		
Thought of ways people kill themselves		.51		
Thought of hurting, but not killing self		.50		
How easy to end it all	.33	.35		
Others better off if dead			.72	
People would be happier if killed self			.71	
No one cared if I lived or died			.61	
Wish never born	.45		.48	
Wish were dead	.34		.40	
If suicide, others realize worth caring about				.99
Only way to be noticed is suicide				.97
Thought life too rotten to continue				.47

 $\it Note.$ Maximum likelihood extraction with Promax rotation. Values less than .33 were suppressed. All item descriptions are paraphrased from actual scale.

of significant relationships among the factors. For the purpose of interpreting the factor structure, only the pattern matrix will be discussed.

As shown in the pattern matrix in Table 2, most items loaded significantly on only one factor. Those few exceptions where cross-

Table 3
Four-Factor Structure Matrix

	Factor 1	Factor 2	Factor 3	Factor 4
Frequency of entertaining the thought	Suicidal	Morbid	Social	Social
of	Pragmatics	Fixation	Isolation	Impact
Wish had right to suicide	.63	.31	.25	.15
If had chance, would kill self	.75	.48	.54	.18
If things don't get better, I would commit	0.1	60		/0
suicide	.81	.60	.37	.40
Wish had nerve to kill self	.80	.61	.38	.48
Wondered if had nerve to kill self	.81	.70	.32	.53
When would commit suicide	.63	.55	.27	.23
Tell others plan to kill self	.52	.44	.02	.60
Killing self would solve problems	.66	.59	.48	.35
Better if I was not alive	.73	.72	.58	.33
Life not worth living	.64	.61	.49	.45
Thought about suicide, but would not	.66	.86	.54	.51
Committing suicide	.75	.88	.35	.51
Having bad accident	.39	.59	.33	.31
People dying	.31	.48	.24	.18
What to write in suicide note	.50	.66	.05	.55
How people would feel if committed	.43	.57	.40	.27
suicide	.13	.5/	.10	.2/
How would commit suicide	.76	.81	.27	.52
Considered writing a will	.13	.29	.10	.09
Thought of death	.43	.55	.26	.31
Thought of ways people kill themselves	.61	.68	.35	.42
Thought of hurting, but not killing self	.58	.67	.44	.38
How easy to end it all	.60	.59	.40	.28
Others better off if dead	.49	.51	.79	.32
People would be happier if killed self	.32	.30	.69	.12
No one cared if I lived or died	.28	.33	.60	.26
Wish never born	.56	.42	.63	.18
Wish were dead	.68	.65	.66	.27
If suicide, others realize worth caring	.35	.40	.22	.89
about Only way to be noticed is suicide	.27	.39	.18	.86
Thought life too rotten to continue	.52	.55	.33	.63
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loadings occurred were for items that tended to meaningfully represent two factors. For instance, the item examining the frequency of thoughts regarding how to actually commit suicide taps both the pragmatic issues of the first identified factor and the fixation on death prevalent in the second factor.

Statistically significant intercorrelations among the factors were anticipated because the items are combined to produce a total score that has been shown to provide meaningful clinical and diagnostic information for adolescents. This anticipation was confirmed (see

Table 4	
Factor Intercorrelation	Matrix

Factor	1	2	3	4
1. Suicidal Pragmatics				
2. Morbid Fixation	.77			
3. Social Isolation	.48	.47		
4. Social Impact	.47	.56	.18	

Table 3), with moderate to strong correlations occurring among three of the factors. The only weak effect was in the correlation between the third (Social Isolation) and fourth (Social Impact) factors. The absence of strong correlation with these two factors is reasonable when viewing the social dynamic relayed in these two factors. The responses offered in the SIQ require the participant to report how often they entertain the target thoughts. It is quite reasonable to expect the students who are most interested in withdrawal and isolation (thereby endorsing items in the Social Isolation factor) to have lower occurrences of thoughts centered in the Social Impact factor, which includes items focusing on their social status following the attempt or completion of suicide.

Discussion

Dimensionality of Suicidal Ideation

Comparison of the factor structure displayed in Table 2 to the normative sample offered by Reynolds (1987) reveals that although the gifted adolescents do not differ from the norm-referenced group in overall level of suicidal ideation (Cross, Cassady, et al., in press), there may be a difference in the structure of the underlying representation of suicidal thoughts in the two groups. As outlined earlier, Reynolds reported three factors: (1) wishes and plans to commit suicide (25 items), (2) focus on the responses and aspects of others (9 items), and (3) morbid ideation (3 items). However, Reynolds and Pinto et

al. (1997) converged on the conclusion that the first factor was sufficiently explanatory and that the additional factors were extraneous.

Unlike the normative sample, the factor structure observed in our data provides evidence that the gifted adolescents in this sample maintained multifactorial conceptions of suicidal ideation. More importantly, the four factors revealed in this exploratory analysis aligned with a theoretical model of suicide that has been used to explain gifted adolescents' suicidal tendencies, lending credence to the provided solution.

The first factor identified for the gifted population is quite similar to Reynolds' (1987) main factor with a primary focus on general wishes and plans for suicide. Our interpretation of this first factor has led to classifying this primary factor as Suicide Pragmatics. That is, the individual has deliberated the methods, legality, and cost-benefits of suicide. Theoretically, this factor is similar to the environmental factor proposed in the suicide trajectory model because the respondents' thoughts include consideration of environmental conditions that are known to be precursors to ideation or suicide attempts (Stillion & McDowell, 1996). A primary difference between the factor solutions for the normative sample and the gifted students in this study is that for the gifted sample the first factor included only 14 of the 30 items, as compared to 25 items in Reynolds' (1987) analyses. This finding aligns with our proposition that gifted adolescents may hold a more multidimensional view of self with respect to the psychological characteristics of suicide.

The second factor generated by our sample, which we refer to as Morbid Fixation, is similar to Reynolds' (1987) Morbidity factor. Unlike the three-item Morbidity factor reported in Reynolds' norming sample, our results have demonstrated 12 items fall into this factor, and attention is focused on death or serious injury in general. This factor differs from the first one mostly in the types of thinking entertained. In Suicide Pragmatics, there is attention to strategy, ability, and timing. However, the items in Morbid Fixation were more general in nature, with loose reference to death and injury. This factor orients effectively with the cognitive factor in the Suicide Trajectory Model. As discussed earlier, cognitive inflexibility and fixation on suicide as a solution is one process through which this factor is a

distinct risk (Holmes, 1991). That is, once the ideator begins to entertain thoughts of death and suicide as a reasonable solution to their stressors, he or she can become fixated and perseverate on self-destructive behaviors. One illustration of this tendency was revealed in the psychological autopsy offered by Cross et al. (2002), where the available information on this gifted male revealed he progressively accepted suicide as a more viable option over a period of nearly 10 years (starting at age 13).

The third and fourth factors are both socially oriented in nature, and align with Stillion and McDowell's (1996) psychological factor. The primary difference between the third and fourth factors appears to be the valence. Items loading on the Social Impact factor assert that others will care about the adolescents' absence through suicide, while in Social Isolation the emotional orientation is such that the individual would not be missed.

The third factor (five items), which we have labeled Social Isolation, centers on various thoughts in which the respondent believes others will be better served with her or his absence. The fourth factor (four items), Social Impact, focuses on communicating suicidal thoughts with others and orientation toward thoughts that others will realize their worth after they are gone. This factor identifies the commonly mentioned "cry for help" that many suicide attempters provide, by discussing suicidal ideations. Furthermore, the social orientation is such that the ideator assumes that the attempt or completion of suicide will garner social attention, sympathy, or regret—somewhat of a "Tom Sawyer effect." These belief systems are aligned with the egocentric value systems and overall poor social outlets reported as common in the psychological autopsies reviewed earlier.

Theoretical and Practical Applications

The use of the SIQ as a screening instrument has been established with general and clinical populations, making use of preestablished cut scores on a total scale value, as well as indications of heightened risk when individuals answer affirmatively to "critical items." The findings in this study suggest the SIQ may have broader diagnos-

tic utility for identifying specific dimensions of suicidal ideation for gifted adolescents. Specifically, the four-factor solution revealed for the gifted population suggests that the SIQ fits conceptually with the suicide trajectory model (Stillion & McDowell, 1996) and may provide particularly useful information for specific orientations of risk for gifted adolescents.

Thus, from a theoretical perspective, the results in this study provide important preliminary evidence that the four factors of risk outlined by the suicide trajectory model (Stillion & McDowell, 1996) are represented even in the ideational phases of suicide for gifted adolescents. The factor pattern explaining the distribution of data for this gifted adolescent sample revealed representation within the SIQ for the cognitive, environmental, and psychological factors. The fourth factor in the suicide trajectory model (biological) is addressed primarily through alternative intake screening processes (e.g., gender, prior identification of biological and chemical imbalances).

The benefit of more refined conceptualizations of the SIQ and adolescent suicidal beliefs and tendencies is expected to provide counselors and significant others with fine-grained indicators of risk for gifted adolescents. Clinically, it is anticipated that recognition of specific ideational factors can be linked to more individually tailored intervention strategies. Those adolescents with high endorsement of the Suicide Pragmatics are those most likely in need of intensive observation and scrutiny, ensuring that the tools and opportunity for suicide are removed from the individual. Adolescents who show high endorsement of the Social Isolation items may benefit from direct intervention focused on improving self-esteem, relief from depression, or simple counseling on social interactions. Those with high scores on the Social Impact factor may benefit more from interventions focused on the realistic outcomes of death and suicide in the public eye.

While we are encouraged by the promising theoretical extension of models of suicidal risk and early identification of those factors, we are also pragmatic and realize that more research is required to establish the theoretical connection between dimensions of suicidal ideation and established risk factors. Specifically, additional validation of the suicidal risk factors needs to be explored. Data from a sizable

clinical suicidal population of both gifted and nongifted adolescents would provide an effective extension to this study.

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